Proposed Working Assumptions for DL Control Signaling (BCH/MAP) in 16m/Legacy Mix Operation

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Jaeweon Cho, Mihyun Lee, Hyunkyu Yu, Hokyu Choi
Jaehee Cho, Heewon Kang, DS Park
Samsung Electronics Co., Ltd.
416 Maetan-3, Suwon, 443-770, Korea

Voice: +82-31-279-5796
E-mail: jaeweon.cho@samsung.com

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Target topic: “Downlink Control Structure”.

Base Contribution:

IEEE C802.16m-08/186r1

Purpose:

To be discussed and adopted by TGm for the 802.16m SDD

Notice:

Release:

Patent Policy:

Proposed Working Assumptions for DL Control Signaling (BCH/MAP) in 16m/Legacy Mix Operation

Jaeweon Cho, Mihyun Lee, Hyunkyu Yu, Hokyu Choi,

Jaehee Cho, Heewon Kang, DS Park

Samsung Electronics Co., Ltd.

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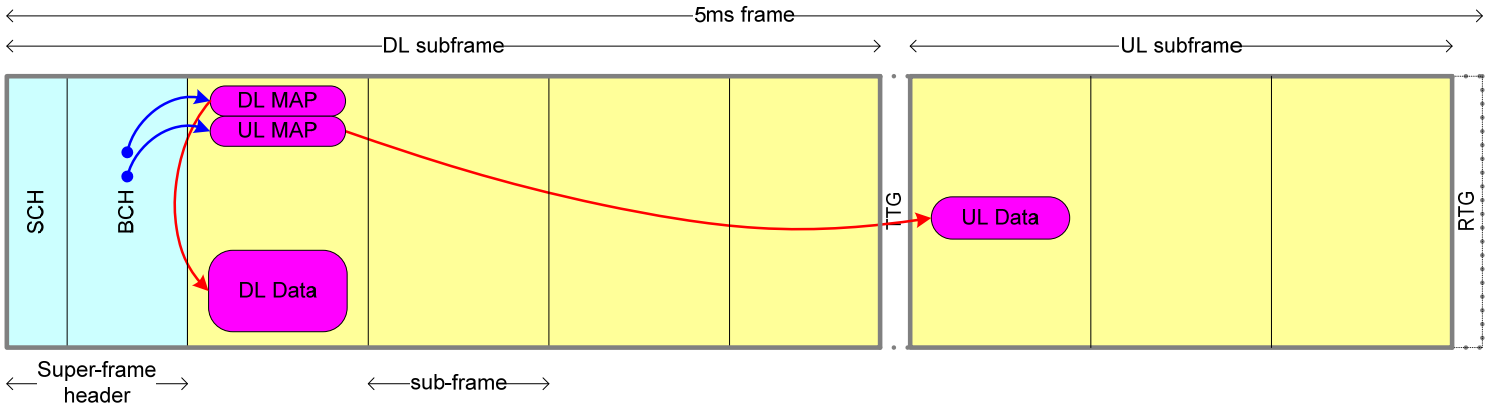
About this Presentation

- Goal and scope of this presentation
  - Propose a high-level working assumption for DL control signaling in 16m/legacy mixed operation
  - Focus on BCH/MAP (FCH/MAP) signaling
- Issue to be resolved in this contribution
  - BCH/MAP (FCH/MAP) signaling for 16m MS in the mixed operation
  - Separate or Shared signaling? (between 16m and legacy MSs)
- Proposed working assumption ⇨ Separate signaling

16m DL Control CH Structure

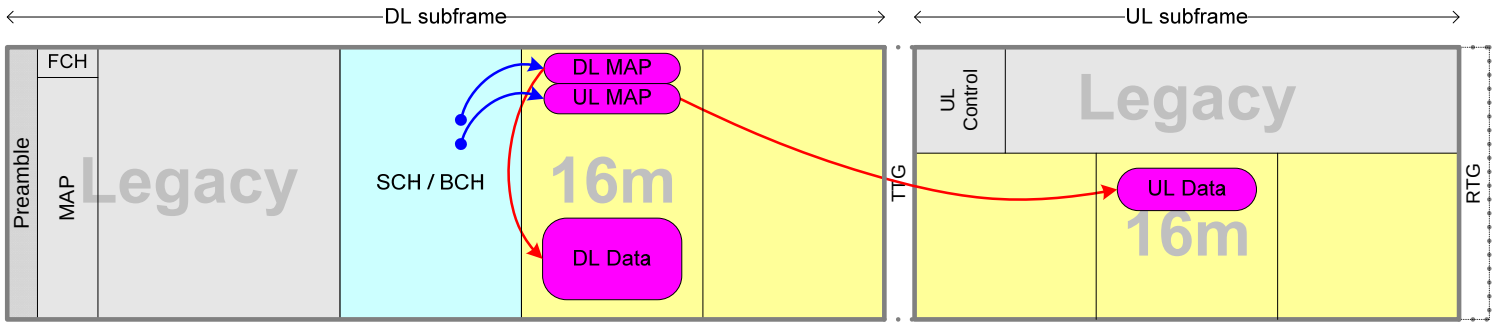
- High level view of basic DL control structure *[IEEE C802.16m-08/062r1]*



  - SCH (synch channel) : Reference signal for system acquisition
  - BCH (broadcasting channel) : System overhead information
  - MAP: Burst assignment
- Acquisition order
  - SCH (time/freq, cell, …) ⇒ BCH (system config) ⇒ MAP (assignment info)
- Other DL control channel: DL ACKCH (feedback for UL), … …

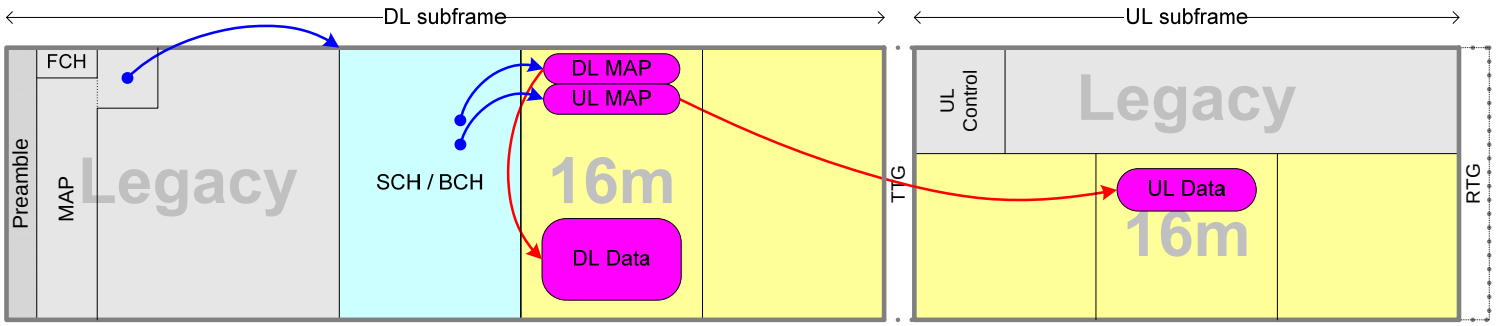
Issue in the Mixed Operation (1/2)

- BCH/MAP(FCH/MAP) signaling approach in 16m/legacy mix operation
  - Shared signaling vs. Separate signaling, between 16m and legacy MSs
- Pros/Cons of *Separate signaling*
  - Pros: Optimized design for 16m, smooth migration to 16m only operation
  - Cons: Concern about an increase in total signaling overhead
- Example: Separate signaling
  - 16m zone indication by 16m SCH/BCH, 16m MAP for 16m bursts
  - Same control channel structure as in 16m only operation

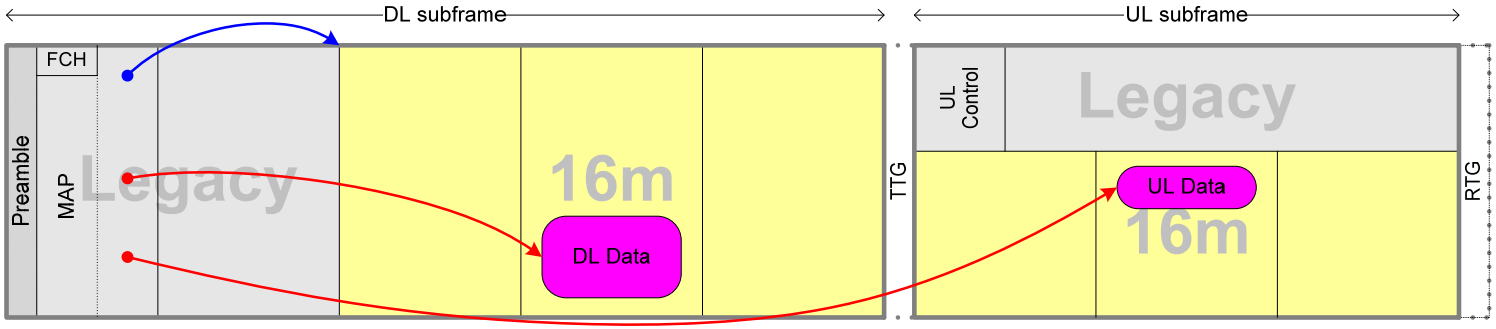


Issue in the Mixed Operation (2/2)

- Example: *Partially* shared signaling
  - 16m zone indication by legacy Zone S/W IE, 16m MAP for 16m bursts



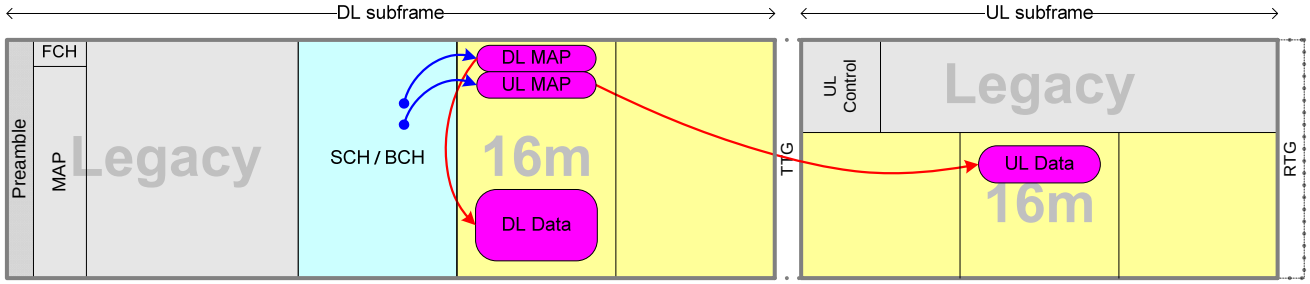
- Example: Shared signaling
  - 16m zone indication by legacy Zone S/W IE, Legacy MAP for 16m bursts



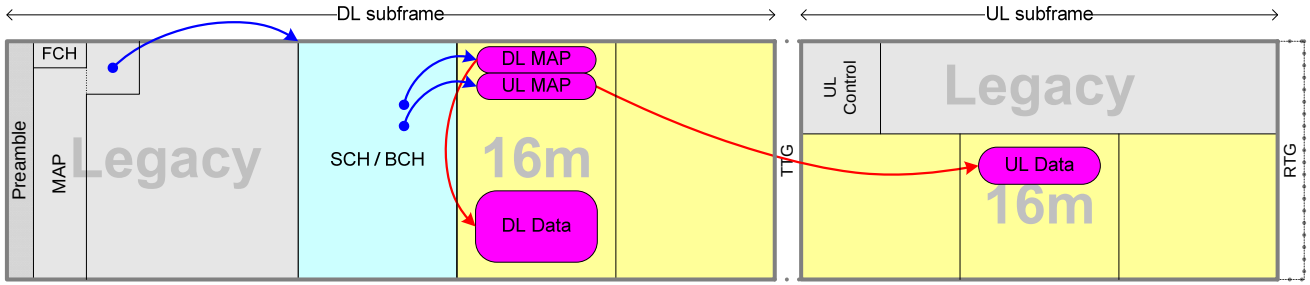
Separate vs. Partially Shared

- Difference: 16m zone indication
  - 16m SCH/BCH (separate) vs. Legacy Zone S/W IE (partially shared)
- Author's proposal ⇒ Separate signaling
  - SCH is of great benefit even in the 16m/legacy mixed opeation
    - Channel estimation of BCH [See, the input contribution *IEEE C802.16m-08/184*]
    - Common structure of BCH between 16m only and 16m/legacy mix operations
  - Thus, no overhead advantage with the partially shared signaling

Separate Signaling



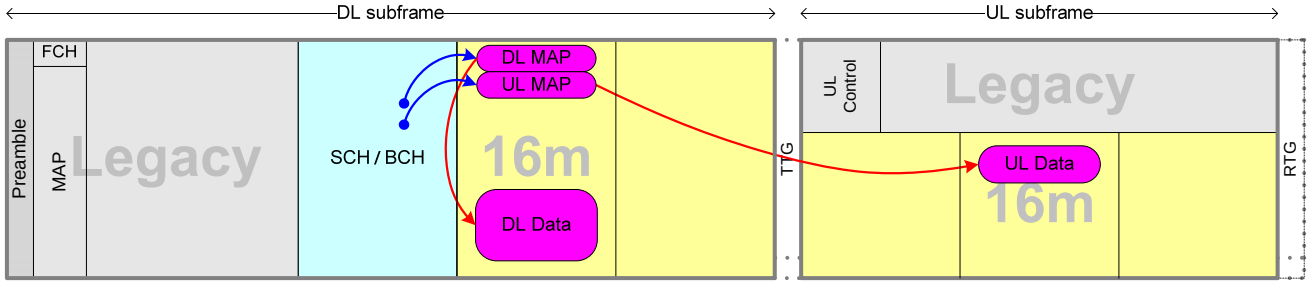
Partially Shared Signaling



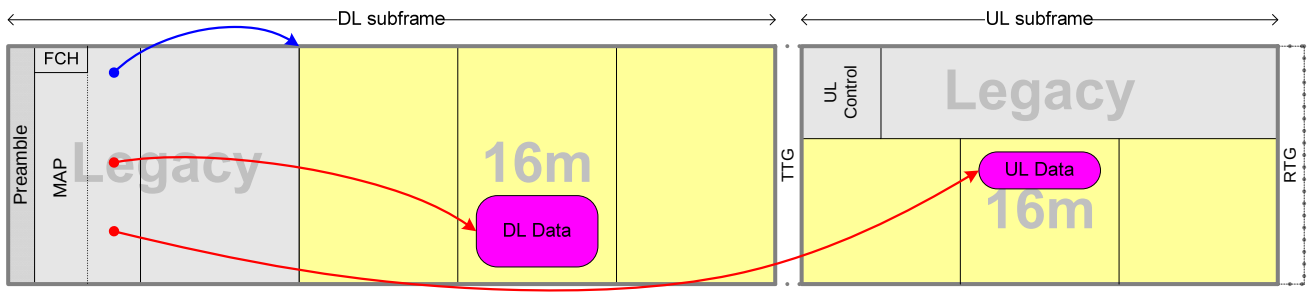
Separate vs. Shared

- Difference
  - 16m Zone Indication: 16m SCH/BCH (separate) vs. legacy Zone S/W IE (shared)
  - 16m Burst assignment: 16m MAP (separate) vs. legacy MAP (shared)
- Author's proposal ⇒ Separate signaling
  - No noticeable gain in overhead, with the shared signaling (see the next slide)
  - Separate signaling provides an optimized design for 16m and also smooth migration to 16m only operation

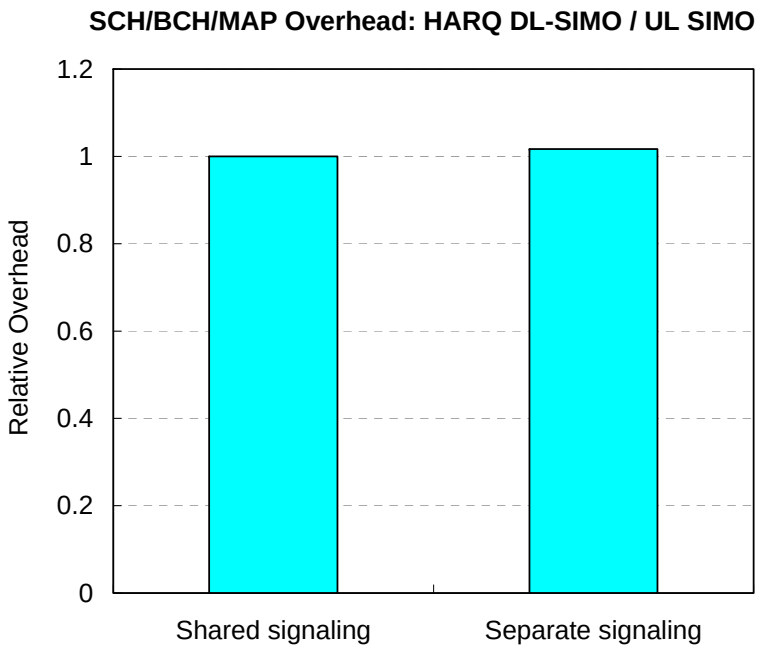
Separate Signaling

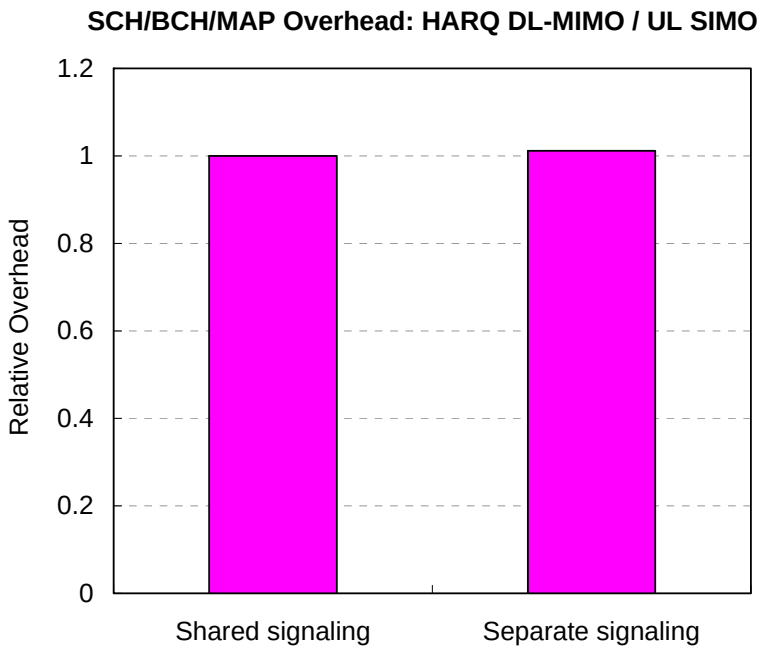


Shared Signaling



Overhead Analysis





- Definition of overhead: number of DL PUSC slots for SCH/BCH/MAP (or Preamble/FCH/MAP) over total number of DL PUSC slots in DL sub-frame
- For details in assumption and calculation for this analysis, see the base contribution

❖ No noticeable gain in overhead, with the shared signaling

Text Proposal for Inclusion in SDD

- Author's proposal: *Separate Signaling*

  ⇨ SCH, BCH, MAP shall be transmitted in the 16m/legacy mix operation

- Proposed text

Add the text into the sub-clause of downlink control channel in [802.16m-08/003]:

11.x. Downlink control channel

…

In the legacy support operation, BS shall transmit SCH, BCH, and MAP in order that a new MS can access the system without decoding legacy FCH and legacy MAP messages.